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ABSTRACT

A study was undertaken to determine the effects of a computer-assisted instruction (CAI) program on the self-concept of mainstreamed, mildly handicapped fifth-grade students (labeled learning disabled, emotionally conflicted, and educable mentally retarded) attending 13 different elementary schools in Tuscaloosa County, Alabama. A control group (N=46) and an experimental group (N=46) were identified using random selection. A literature review had revealed that while efforts to integrate mildly handicapped students into regular classrooms have increased, much evidence existed that these students are not well accepted in mainstream situations by teachers and peers. Negative self-concept appeared to play a significant role, and several researchers have investigated the potential uses of CAI for improving self-concept in learning-disabled and other handicapped students. Results of this study showed that CAI does not, in and of itself, lead to a positive self-concept in students. Only one aspect of self-concept, physical appearance and attitudes, was affected by CAI. The study confirmed the realization that instructional programs for mainstreamed, mildly handicapped students require considerably more research in order to identify how CAI might effectively influence the self-concept of such students. (Author/VW)

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THE EFFECTS OF A COMPUTER-ASSISTED INSTRUCTION PROGRAM ON PEER ACCEPTANCE, TEACHER ACCEPTANCE, AND SELF-CONCEPT OF MILDLY HANDICAPPED STUDENTS

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ABSTRACT: "THE EFFECTS OF A COMPUTER-ASSISTED INSTRUCTION PROGRAM ON SELF-CONCEPT OF MAINSTREAMED MILDLY HANDICAPPED STUDENTS"

Efforts integrating mildly handicapped students into regular classrooms continues at an accelerated rate. However, there is much evidence that mainstreamed mildly handicapped students are not well accepted into regular classrooms by teachers and by peers. The purpose of this study was to determine the effects of a computer-assisted instruction program on self-concept of mainstreamed, mildly handicapped students.

Subjects for the study were fifth-grade students attending 13 different elementary schools in Tuscaloosa County, Alabama. A control group (N-46) and an experimental group (N-46) were identified using random selection.

Results showed that CAI does not, in and of itself, lead to a positive self-concept in students. Only one aspect of self-concept, physical appearance and attitudes, is affected by CAI. Finally, the study confirms the realization that instructional programs for mainstreamed, mildly handicapped students require considerably more research in order to identify how CAI might effectively influence the self-concept of such students.

Using CAI to Improve Self-Concept, Teacher Acceptance, and Peer Acceptance of Mainstreamed Mildly Handicapped Students

Glock (1972) in his article, "Is There a Pygmalion in the Classroom," stated "A negative self-image is its own best defender." Today, a decade after the passage of PL94-142 (The Education For All Handicapped Children Act), handicapped students continue to be mainstreamed into regular classroom settings despite their negative feelings about "self" (Bruininks, 1978; Carroll, Friedrick & Hund 1984; Drabman & Patterson, 1981; Lewis & Doorlag, 1983; Yauman, 1980). Because of poor self-concept development, these students are stifled from attaining positive social and academic experiences in regular classrooms. In addition to problems of poor self-concept, mainstreamed mildly handicapped students experience problems with teacher rejection (Bryan, 1976; Garrett & Crump 1980) and peer rejection (Bruininks, 1978; Garrett & Crump, 1980). (Bryan, 1974a, 1974b), for example, reported learning disabled students as being unpopular with peers, worried, frightened, unable to have a good time, sad, untidy, and more often ignored or rejected by teachers and peers than were nonlearning disabled students.

Comprising about 75% of those students with handicapping conditions (Lewis & Doorlag, 1983), mildly handicapped students occupy three categories: mild learning disabilities (LD), mild mental retardation (EMR), and mild

emotional disturbance (EC) (Hallahan & Kauffman, 1977). With mainstreaming, it was the assumption that these students would benefit socially because of exposure and closer proximity with regular classroom teachers and nonhandicapped peers (Bryan & Bryan, 1978; Carlberg & Kanvale, 1980; Scranton & Ryckman, 1979). But there continues to exist an abundance of evidence echoing the rejection of mainstreamed mildly handicapped students by their regular classroom teachers (Bryan, 1974a; Bryan, 1976; Cartledge, Frew, & Zaharias, 1985; Childs, 1981) and their nonhandicapped peers (Bruininks, 1978; Garrett & Crump, 1980; Perlmutter, Crocker, Cordray & Garstecki, 1983). Mainstreamed mildly handicapped students find it difficult to interpret the verbal and nonverbal cues of their nonhandicapped peers (Bryan & Bryan, 1978); consequently, they emit and receive statements of hostility and rejection, and even use offensive language when communicating with their nonhandicapped peers (Bryan & Bryan, 1978). Even though regular classroom teachers perceive mainstream mildly handicapped students to be a significant threat to the learning atmosphere (Feldman & Altman, 1985), mainstreamed mildly handicapped students view themselves to be more highly acceptable than they actually are (Heron & Harris, 1982). Johnson and Johnson (1978) asserted,

> It is when handicapped students are liked, accepted, and chosen as friends that mainstreaming becomes a positive influence on the lives of both handicapped and normal progress students (p. 153).

Purkey (1970) concluded, when a student fails academically, this failure is a consequence of poor self-concept.

Since there is strong confirmation that mainstreamed mildly handicapped students are not that welcome in regular classrooms by teachers and normal peers, and even exhibit poor self-concept, educators cannot assume that, with the wave of some magic wand, these problems will disappear. Strategies must be devised to assist mainstreamed mildly handicapped students with the improvement of self-concept. Ultimately an improved self-concept will generate more peer and teacher acceptance for the mainstreamed mildly handicapped student. Or, perhaps more peer acceptance and teacher acceptance will improve the self-concepts of mainstream mildly handicapped students. Equally important, an improved self-concept will enable the mainstreamed mildly handicapped student to feel better about himself/herself.

An instructional strategy that appears to have merit for mainstreamed mildly handicapped students is computer-assisted instruction. It is a procedure by which these students can receive direct instruction (Lewis & Doorlag, (1983), and is especially helpful for ameliorating problems of a social/emotional nature (Cartwright, Cartwright & Ward, 1984; Furst, 1983; Huntgate, 1982; Schiffman, Tobin, Buchanan, 1982).

While numerous studies were found depicting CAI to be an effective strategy for improving academic achievement, no studies could be found suggesting CAI to be an effective

strategy for altering self-concept, teacher acceptance, and peer acceptance of mainstreamed mildly handicapped students. The purpose of this paper is to first present studies that reveal the rejection of mainstreamed mildly handicapped students by their teachers and peers as well as studies that indicate how mainstreamed mildly handicapped students are affected by poor self-concept. Next, a study that was conducted in the Tuscaloosa County Alabama Schools to determine how CAI affected self-concept, teacher acceptance, and peer acceptance of mainstreamed mildly handicapped students will be presented.

Review of the Literature

Teacher Acceptance

Larrivee (1981) believed when regular classroom teachers display acceptance towards mainstreamed mildly handicapped students in regular classrooms and respond to their feelings positively, this action surpasses any curriculum or administrative strategy involving mainstreamed mildly handicapped students. Childs (1981) surveyed the attitudes of 200 regular classroom teachers about EMR students in regular classrooms. Instrumentation included a 14-item questionnaire in which the teachers indicated by a "yes" or "no" response their sentiments about teaching EMR students in their regular classrooms. Upon review of teacher ratings, the researcher learned that regular classroom teachers were not in favor of teaching EMR students in regular classrooms.

In another study, Vandivier and Vandivier (1981) questioned 75 teachers to examine their views about mainstreamed mildly handicapped students. The researchers were curious to know the degree to which regular classroom teachers displayed more favorable attitudes toward LD, EMR, and EC students in regular classrooms. A questionnaire which the respondents answered anonymously was used to ascertain this information. Results indicated that more favoritism was directed to LD students than to EC students. EMR students were reported to be the least favored.

Feldman and Altman (1985) employed a hypothetical situation to investigate negative teacher attitudes toward mainstreamed mildly handicapped students. Teachers were randomly assigned a profile depicting an EMR male student portrayed as being aggressive and a disciplinary problem because of frustration and nonconformity to school or classroom rules. To assess teachers' opinion about the profiled student's potential for success in the regular classroom in terms of social emotional factors, personal growth, and classroom membership, the researchers asked them to respond to an integration inventory. During this investigation, significant differences surfaced: the behavior of EMR students was perceived as being detrimental to classroom instruction. Further, the presence of these students in regular classrooms prohibited the academic growth of normal students and even caused the teacher's competence to deteriorate.

Moore and Fine (1978) studied 61 teachers of the educable mentally retarded, learning disabled, and nonhandicapped students to investigate the manner in which they perceived normal and mildly handicapped students, and to determine their attitudes about mainstreaming in general. The researchers utilized interpersonal checklists and questionnaires which were completed for hypothetically normal students, EMR, and male LD students ten years of age. This study revealed that no significant differences existed concerning the teachers's perception of the sterotypic behavior of the three types of students. However, regarding mainstreaming, differences did exist; teachers were more in favor of mainstreaming for LD students than for EMR students. Similarly, Jacobs (1978), with a sample of 40 elementary teachers and a hypothetical situation involving a fourth-grade LD male student, demonstrated that the LD labeled student carried negative connotations, suggesting that LD students are less popular with their teachers in regular classrooms.

Studies attesting to the negative attitudes of regular classroom teachers towards EC students have been conducted in regular classroom settings as well as in institutional settings. Vacc and Kirst (1977) explored the feelings of 149 regular classroom teachers about EC students in their classrooms. This investigation was designed to provide responses to three questions: (1) Would EC students fare better in a regular or self-contained classroom? (2) How

would mainstreamed EC students affect their nonhandicapped peers? and (3) What impact would mainstreamed EC students have upon their classroom teaching? The 20-item questionnaire administered to the 149 regular classroom teachers illustrated that mainstreamed EC students were not accepted by their normal peers and that regular classroom placement would have a detrimental effect on the learning of these normal students. The researchers further contended that the presence of EC students would affect teacher behavior adversely.

In a similar vein, Coleman and Gilliam (1983) surveyed 139 regular classroom teachers, grades 1 to 6, to determine teacher acceptance of mainstreamed EC students. Teachers read a vignette of a hypothetical EC student and then reacted to a 29-item questionnaire in which three major concerns were addressed: concern for self, concern for mainstreamed EC students, and concern for nonhandicapped students. The study revealed that EC students, because of their aggressive behavior, were not well accepted by their regular classroom teachers.

Peer Acceptance

Peer acceptance of mainstreamed mildly handicapped students continues to be a major concern to researchers interested in the special education of handicapped students. As reported by Heron and Harris (1982), lack of peer acceptance can have a deleterious effect upon the mainstreamed mildly handicapped students' self-concept and

academic performance. One of the first and most often referred to studies about the social position of mentally handicapped children within regular classrooms was conducted by Johnson (1950). Johnson used a total of 698 students and a sample population of 39 mentally retarded students and asked them to name three or more of their classmates using six questions: three questions for acceptance and three involving rejection. Upon review of the sociometric questionnaire, the mentally retarded students were shown to be significantly more rejected than their nonhandicapped peers on the basis of antisocial behavior. Likewise, Lapp (1957) assessed the social acceptance of partially integrated mentally retarded students. With a population of 16 students and the Johnson (1950) questionnaire, the researcher reported that the acceptance scores for mentally retarded students were significantly lower than for nonhandicapped students.

Similarly, negative attitudes were found in other studies. In a regular classroom setting, Cartledge et al. (1985) used a videotaped presentation depicting an LD and non-LD male student to determine the social acceptance of mainstreamed LD students. After review of the videotape, a 15-item questionnaire involving play, communication, and academic behavior was administered to 450 elementary students. The results indicated that while LD students would be benevolent to their non-LD peers, non-LD students still preferred social interaction with other non-LD

classmates. In addition, the LD student was portrayed as a slow worker in constant need of the teacher's attention. At the same time, Bryan, Donahue, and Pearl (1981) found LD students to be less disagreeable, and the least likely to argue their position within a group setting.

Davids and Parenti (1958a) designed a study that compared the peer relationships and personality characteristics of 48 EC students in a residential treatment center to those of normal students attending a public school and a summer camp program. Instrumentation consisted of a verbal interview and behavior checklist in which friendships were selected and behavior recorded. In this study, EC students in the residential setting and summer camp program were found to be better emotionally adjusted than the normal students attending the public schools. As reported by Davids and Parenti, the EC students not chosen as friends appeared more disturbed than the EC students selected as friends of normal peers. Later this study was replicated by Davids and Parenti (1958b) when they compared EC students in an institutional setting with a group of students in a public school setting and a summer camp program. Again, the researchers confirmed that friendship choices for EC students were significantly fewer.

Self Concept

The more one knows about today's students, the better the chances are for being more sensitive to their needs. An understanding of self-concept is crucial, not only to the

mainstreamed mildly handicapped student's academic growth, but his/her social emotional growth as well. Rubin, Dorle, and Sandige (1977) examined the relationship between self-esteem, academic achievement, and school behavior. A total of 530 twelve-year-old participants comprised this study. Following administration of the Coopersmith Self-Esteem Inventory, the WRAT and the School Behavior Profile self-concept was shown as not having a strong independent effect on school achievement or behavior.

Believing that behavior and self-concept are strongly related, Reynolds (1980) had teachers administer the Coopersmith Self-Esteem Inventory and the Classroom Behavior Rating Scale to 55 elementary students. A significant relationship was found between classroom behavior and self-concept.

In a study by Battle and Blowers (1982), 168 students, grades 1-7, participated in a study that confirmed the belief that LD and EMR students instructed in segregated classrooms made greater gains in self-concept than mainstreamed mildly handicapped students attending regular classrooms. The researchers implied that instructional decisions should include both the cognitive and affective needs of mainstreamed mildly handicapped students in regular classrooms. Battle and Blowers also mentioned that further research is necessary for the development of specific instructional strategies that will not only improve academic achievement, but also facilitate the development of positive self-worth for mainstreamed mildly handicapped students.

Concurring with Dunn (1968) that labeling a child as "handicapped" and committing that child to a segregated special education classroom can have a pernicious effect on a child's self-concept. Carroll, et al. (1984) investigated the academic self-concept of mainstreamed EMR and LD students, and nonhandicapped students. Instruments for this study were the Student Self Evaluation Scale (SSE) and Teacher Evaluation Scale (TES) which assess measures of perceived academic self-concept. As for student evaluations, significant differences were noted among groups: (a) nonhandicapped students had better self-concepts than LD students; and (b) LD students had better self-concepts than EMR students. Teacher estimates of self-concept reported that nonhandicapped students had better self-concepts than EMR and LD students. Carroll et al. claimed that curricular efforts should focus on strategies to assist handicapped students with the development of a more positive self-concept since the affective component of education is equally as important as learning to read, write, comprehend, and think.

A study by Yauman (1980) investigated the relationship between degree of special education and self-concept. A total of 45 LD elementary male students with IQ scores above 80 composed this study. Subjects were assigned to one of three groups: (a) segregated class for LD students, (b) regular class for remedial services, and (c) a control group with no learning problems. Two instruments were employed:

The Piers-Harris Self-Concept Scale to assess self-concept, and the Wide Range Achievement Test (WRAT) were used to assess reading ability. Of the three groups, the regular class group ranked the highest. Mainstreamed LD students with remedial support ranked the lowest on self-concept. These findings endorsed the results of a similar study by Ribner (1978) who investigated a population of 613 male LD students assigned to special class placement and found that these students had significantly lower academic self-concepts than normal students. No differences were shown between groups as far as perception of general competence.

Studies by Bruininks (1978a, 1978b) assessed the self-concept and interpersonal needs of mainstreamed LD students, and findings confirmed that these students experience personality problems. The researcher mentioned that mainstreamed LD students have the same basic needs as other children including the need for affection, inclusion, and control. The need to have some control over their environment was very intense.

Computer-Assisted Instruction

The use of Computer Assisted Instruction (CAI) as a supplement to teaching is fast gaining widespread attention. Research in this area is of great interest to many educators, particularly as to how CAI might be used with children having special learning needs. Many believe that CAI could prove valuable in the process of teaching and learning.

Watkins & Webb (1981) conducted a study to assess the impact of CAI on 58 learning disabled students assigned to special education classrooms. Pre- and posttesting consisted of the California Achievement Test. This study indicated that subjects taught mathematics through CAI achieved significantly higher than the students taught mathematics using the traditional method.

Interested in examining the effectiveness of CAI for handicapped learners, McDermott and Watkins (1983) employed 205 LD students grades 1-6, and assigned them to the control group for mathematics and spelling with no CAI assistance or the experimental group for mathematics and spelling with CAI. The results confirmed that CAI combined with the conventional method of remedial instruction was more conducive to the needs of handicapped learners. According to the researchers, success with CAI is contingent upon the severity of the learning disorder as well as being contingent upon the mode of learning. These conclusions support the findings of Budoff & Hutten (1982) that the conventional instruction method supplemented with CAI is consistently more effective than other instructional modes of learning for special education students.

The microcomputer has the capacity to improve attitudes of students who are reluctant to learn (Forman, 1982; Yates, 1983). In a residential setting, Carmon and Kosberg (1982) saw the need to adopt the use of CAI for their study involving 40 emotionally disturbed children age 7-14 years.

To assess the effects of CAI on emotionally disturbed children as related to mathematics achievement and attention-to-task, a control group using no CAI and an experimental group using CAI were formed. Testing consisted of the Stanford Achievement Test for mathematics, while attention-to-task was measured though direct observation. After completion of the study, researchers confirmed that CAI was more significant than the non-CAI method of instruction.

A study of Debonis, Joseph, and Preziaso (1982) showed that CAI was capable of producing significant results with subjects who had been labeled learning disabled, educable mentally retarded, and gifted. With CAI, the study revealed that these subjects improved their communication skills with peers, improved their interaction with teachers, increased their academic achievement, and reported an enjoyable experience from having been exposed to the computer.

Schiffman et al. (1982) elaborated upon the social/emotional aspects of CAI based upon the outcome of a study conducted at the Johns Hopkins Training Center for Learning Disabled Students. At the Center, LD students received reading and writing instruction with the aid of CAI for a period of 5 weeks. This instruction encompassed two approaches: the language experience approach to reading and the multisensory approach. Games and programming directly related to the computer were also made available to the children. At the completion of the project, interesting

results emerged: (a) some of the least motivated students became increasingly motivated, (b) students gained a higher sense of self-esteem, (c) students appeared more self-confident, and (d) parents reported positive attitudes in their children. These results, as declared by Schiffman et al., were directly correlated with the computer which is "user friendly," meaning it uses students' names when assigning lessons, allows students to make mistakes without ridicule, and provides continuous feedback and praise.

Braun & Braun & Slobodizan (1982) commented on the competency of CAI by indicating that the computer is effective because of its "Rogerian" qualities of "genuineness" and "congruence." "It can be programmed to positively regard anyone who uses it" (p. 509). When students use CAI, they attain a feeling of security and are able to explore their feelings, beliefs, and behavior while receiving appropriate feedback.

Finally, Huntgate (1982) compared the effects of CAI to the conventional method of instruction and indicated that students assigned to CAI made significantly higher gains on all tasks than the group who had received no CAI. She further reported that students who had been instructed with CAI were not afraid to make a mistake with the computer even though they felt intimidated in the regular classroom when uncertain about an answer.

The Tuscaloosa County Alabama School Study

Methodology

The purpose of this study was to examine the effects of a CAI program on peer acceptance, teacher acceptance, and self-concept of mainstreamed mildly handicapped students. Participating in this study were 13 Tuscaloosa County elementary schools, including 27 regular classroom units contain mildly handicapped students. These schools included Brookwood, Cottondale, Crestmont, Englewood, Flatwoods, Huntington Place, Mathews, Maxwell, Myrtlewood, Vance, Vestavia, Walker, and Westwood.

The following hypotheses were formulated for this for this study and tested in the null form using a .05 criterion of significance:

> Null Hypothesis 1: There is no statistically significant difference between mainstreamed mildly handicapped students receiving CAI and mainstreamed mildly handicapped students not receiving CAI on scales for peer acceptance as measured by the Peer Acceptance Scale (Lilly, 1971), for teacher acceptance as measured by the Q-Sort technique (Block, 1961), for the self-concept as measured by the Piers-Harris Self-Concept Scale (Piers, 1984).
>
> Null Hypothesis 2: There is no statistically significant difference between mainstreamed mildly handicapped students classified as EC, LD, and EMR for peer acceptance as measured by the Social Acceptance Scale (Lilly, 1971), for teacher acceptance as measured by the Q-Sort technique (Block, 1961), and for self-concept as measured by the Piers-Harris Self-Concept Scale (Piers, 1984).
>
> Null Hypothesis 3: There is no statistically significant difference between pre- and posttest scores for mainstreamed mildly-handicapped students on scales for peer acceptance as measured

by the Social Scale (Lilly, 1971), for teacher acceptance as measured by the Q-Sort technique (Block, 1961), and for self-concept as measured by the Piers-Harris Self-Concept Scale (Piers, 1984).

Null Hypothesis 4: There is no statistically significant interaction between the three dimensions of (a) experimental and control groups (CAI or non-CAI); (b) mildly handicapped students classified as LD, EC, and EMR; and (c) pre- and posttest for peer acceptance as measured by the Social Acceptance Scale (Lilly, 1971), for teacher acceptance as measured by the Q-Sort technique (Block, 1961), and for self-concept as measured by the Piers-Harris Self-Concept Scale (Piers, 1984).

The Sample

Fifth-grade mainstreamed mildly handicapped students, labeled learning disabled, emotionally conflicted, and educable mentally retarded, from 27 intact regular classroom units were the participants for this study. These students were all residents of Tuscaloosa County and ranged in age from 10-13 years. Of the 92 students participating in the study, fifty-four students were white and 38 were black. In addition, the number of boys (66) exceeded the number of girls (26) (Table 1).

Materials

The materials necessary for this study were the instruments to assess (a) self-concept, (b) teacher acceptance, peer acceptance, Apple IIe microcomputers, and software that consisted of drill/practice and games. All equipment and materials (hardware/software) were furnished by the Tuscaloosa County Schools. Some software was

furnished by the Division of Curriculum and Instruction, The University of Alabama. Instruments to measure self-concept, teacher acceptance, and peer acceptance were furnished by the researchers.

Instrumentation

Teacher Acceptance

Teacher acceptance of mainstreamed mildly handicapped students was assessed with a modified Q-Sort technique. (Block, 1961). The modified Q-Sort derived from the process resulted in an 11-column structure consisting of blocks that formed a pyramid and resembled the normal curve. The columns, which correspond with column designations, were numbered from 1-11 and designated from "nonaccepted" to "very much accepted." Each of the teachers were provided a Q-Sort format and instructed to write the name of one student in each block. With a range from 1-11, each student's score was determined by the numerical value assigned to the column into which each student's name was placed.

Peer Acceptance

A Social Acceptance Scale (Lilly, 1971) was used to assess peer acceptance. The scale consists of four choices with ratings ranging from 0-3. For example, the highest rating with "YES" was assigned a value of +3, followed by "Yes" with +2 points, "yes" with +1 point, and "?" with a 0. A class average score was computed for each student to control for varied enrollment figures. This was obtained by

dividing the total peer acceptance score for each student by the total number of participants.

The Peer Acceptance Scale was completed by 760 students including the 92 mainstreamed mildly handicapped students.

Self-concept

The Piers-Harris Children's Self-Concept Scale (Piers, 1984) was employed to assess the self-concept of the mainstreamed mildly handicapped participants. The Piers-Harris Self-Concept Scale is comprised of 80 statements of a declarative nature to which students responded with a "yes" or "no," to test questions that were positively and negatively keyed on an equal basis. With this instrument there were six subtests relevant to a child's self-concept: (a) behavior, (b) intellectual and school status, (c) physical appearance and attributes, (d) anxiety, (e) popularity, and (f) happiness and satisfaction.

Statistical Design

Using the SPEC50 random number generator from the Behavioral Sciences Statistics Program Library (Barker & Barker, 1977), the researchers randomly placed the students into the experimental group (46) or the control group (46). Experimental group participants received a generalized curriculum (mathematics, language arts, reading, health, social studies, and science) supplemented with CAI for 20 minutes daily over a period of 5 weeks. Control group participants received the same generalized curriculum, but they did not receive any computer-assisted instruction.

The statistical design used in this study was a Lindquist Type III in a multivariate analysis of variance framework (Barker & Barker, 1984). This designed incorporated two between-subjects components and one within-subjects component. The Wilks' lambda test criterion was used to test for statistical significance at a predetermined alpha level of .05. Following the decision strategy of Hummel and Sligo (1971), the researchers computed the univariate analyses of variance according to the significant multivariate F ratios. All significant univariate F ratios were followed by t tests to determine group differences.

Findings

The primary objective of this study was to examine the effects of a CAI program on peer acceptance, teacher acceptance, and self-concept of mainstreamed mildly handicapped students. In examining the overall MANOVA, statistical significance was found for the main effects- CAI or nonCAI. Univariate tests following the significant Wilks'lambda showed no statistically significant results ($p < .05$) for behavior, intellectual and school status, popularity, anxiety, happiness and satisfaction, teacher acceptance, and peer acceptance. Statistically significant results ($p < .05$) were found, however, for the variable-physical appearance and attributes. An analysis of the mean scores between the two groups (CAI/non-CAI) revealed that the non-CAI group scored higher (9.91) than the CAI group

(6.70) on that one aspect of self-concept (physical appearance and attributes).

Conclusions

Results indicate that although the CAI group scored lower on physical appearance and attributes, this does not detract from the other aspects of self-concept (behavior, intellectual/school status, popularity, anxiety, and happiness and satisfaction), and has no effect on teacher or peer acceptance. This might be interpreted that, if CAI is used in a setting with normal children, they are accepted to the same degree in a regular class or a computer-oriented class. If the children like using the computer (and comments suggest they do) then CAI is a viable instructional alternative to be used for instructing mainstreamed mildly handicapped students with poor self-concept problems relative to physical appearance and attributes. Meanwhile, no measure was taken of their attitude toward the subjects studied (language arts/mathematics) or of their attitude toward the computer.

Upon further analysis of the results relative to self-concept, the researchers surmised that findings could have been an artifact of the test itself. For example, six subtests comprised the Piers-Harris Scale, and many items within the various subtests (behavior intellectual/school status, popularity, anxiety, and happiness and satisfaction) cluster with other test items within the six subtests. In addition, some of the words

such as "pep," "popularity," and "nervous," included in the scale, may have been too difficult for the students to conceptualize even though explanations had been provided. Further, the CAI group scored high initially; perhaps, they were unable to score any higher.

Teacher acceptance, peer acceptance, and self-concept all are areas that tap the affective domain. This study-effects of CAI on teacher acceptance, peer acceptance, and self-concept of mainstreamed mildly handicapped students was about feelings, beliefs, and emotions. To effectuate such changes pertinent to the study of affective behavior, a reasonable amount of time should be allocated. In this study, only a five-week period of time had been allocated for examining the effects of CAI on teacher acceptance, peer acceptance, and self-concept of mainstreamed mildly handicapped students.

There are other reasons that could very well justify the results of this study. One reason, control group members, simultaneously, received resource room support services while experimental group members received their treatment--CAI. For some experimental group participants, the resource room was the designated area to receive the treatment--CAI. Other experimental group participants received CAI from Chapter I teachers in well-designed computer labs. Initially, these teachers (Chapter I) were reluctant to provide this instruction, although they relished the experience later.

Finally, the LD student predominated this study. Learning disabled students are such a diverse group socially, psychologically, and academically. It is possible that the diversity of characteristics linked to LD students could have impacted this study negatively.

Recommendations

Further studies should be conducted that investigate the effects of CAI on teacher acceptance, peer acceptance, and self-concept. However, such studies should be done over an extended amount of time (six months to a year). Also, studies should be done that include specific characteristics of LD students, for example, reading ability, race, and learning style. Future studies should also explore other instruments to assess self-concept.

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